REMARKS/ARGUMENTS

Claims 5-16 are pending in this application. In response to the final Office Action, claims 5 – 9 have been canceled without prejudice or disclaimer of applicants' right to pursue patent protection for the subject matter thereof in a subsequent continuing application.

Entry of this Amendment is respectfully requested as it is believed to place the entire application in condition for an allowance or, at a minimum, to materially reduce the issues for an appeal. Upon such entry, claims 10-16 will be pending in the application.

Telephone Interview With the Examiner

Applicants appreciate the courtesies extended by Examiner Kunemund to their representative, Mark A. Farley, Esq. (Reg. No. 33,170) during a telephone interview concerning this application held on October 29, 2008 and again during a follow-up telephone discussion of the application held on November 13, 2008.

During the interview, the rejection of claims 5, 8, 10, 13, 15 and 16 under 35 USC 103 over Lee et al. (2002/0179000) was discussed (see Office Action pp. 2-3), as was the rejection on p. 3 of the Office Action of claims 6, 7, 9, 11, 12 and 14 under 35 USC 103 over the same Lee et al. reference (i.e., 2002/0179000). While agreement as to the patentability of the claims was not reached, the Examiner did indicate that he would be more 'favorably disposed' towards allowing claims 10-16 pending in the application than claims 5-9. Accordingly, in an effort to advance the prosecution of this application, applicants have elected herein to cancel claims 5-9 without prejudice or disclaimer. The remaining claims, nos.10-16, are believed to be distinguishable over the cited prior art for the reasons discussed with the Examiner during the interviews on October 29th and November 13th, 2008, which reasons are reiterated below for the Examiner's consideration.

Rejection Under 35 U.S.C. §103

In the present Office Action, claims 10-16 are rejected as indicated above under 35 USC 103 over the Lee et al. United States Patent Application Publication No. US 2002/0179000 A1 for the reasons set forth on pp. 2-3 of the Office Action mailed July 2, 2008. The rejection is respectfully traversed.

Of the rejected claims 10-16, only claim 10 is written in independent form and it reads as follows:

A process of preparing a single crystal, comprising:

a first step of mixing 0.09 to 0.20 mol, 0.09 to 0.20 mol and 0.01 to 0.27 mol of magnesium oxide (MgO) or zinc oxide (ZnO), niobium oxide (Nb_2O_5), and titanium dioxide (TiO_2), respectively, with one another;

a second step of adding additives to facilitate a reaction of the mixture obtained in the first step or control the properties of the mixture and causing the resultant mixture to react at a high temperature;

a third step of mixing the compound obtained in the second step with one selected from lead oxides having a formula of Pb_xO_y in an amount of 0.55 to 0.65 mol, drying and calcining the resultant mixture, and pulverizing the calcined product into powder; and

a fourth step of melting the powder obtained in the third step under high temperature and pressure and slowly cooling the melt to be crystallized.

During the October 29, 2008 telephone discussion with the Examiner, applicants' representative noted that in the previous Office Action concerning this application - bearing a mailing date of October 4, 2007, the Examiner had acknowledged (see, e.g., p. 3) that the composition claimed for use by the applicants, i.e., in the process according to claim 10, was different from that described in the cited Lee et al. reference. The Action then states further, however, that in the absence of unexpected results the presently claimed materials recited for use in, e.g., the method of claim 10, 'would have been obvious to one of ordinary skill in the art to determine through routine experimentation ', i.e., in a quest to optimize the properties of the final product.

Further to the above, however, during the interview(s) concerning this case applicants' representative submitted that, as was extensively argued in applicants' previous response filed on April 3, 2008, the process recited for use in claim 10 was also significantly different from that described in the cited Lee et al. reference. Applicants' representative pointed out that, as noted on pp. 7 - 8 of the April 3, 2008 response, the process recited in independent claim 10 has as its purpose improving the properties, for example, the electromagnetic, optical and electro-optical properties of the resultant ferroelectric material, as well as serving as a means for overcoming the

limitation on the size of single crystals and the uniformity otherwise required of ingredient(s) needed in growing such single crystals. Further, the process recited in claim 10 contributes to the uniformity of the resultant composition, as well as to an improvement in the ferroelectric properties of a single crystal which is grown from the ceramic compound. As is well known among those having an ordinary level of skill in this art, the property of a ferroelectric ceramic compound, or single crystal thereof, depends upon (1) the starting materials used in the method and, (2) the method steps themselves. Thus, since the starting materials recited in claim 10 are recognized (even by the Examiner) as being different than those described for use in the method of claim 10 and (as discussed further below) the method steps recited in claim 10 are also different than the method taught in the subject Lee et al. reference, applicants submit that claim 10 and claims 11-16 that depend from the subject independent claim, are distinguishable over the teachings contained in the cited Lee et al. reference.

In contrast to the method recited in, e.g., applicants' claim 10, the Lee et al reference relates to a method for growing single crystals of Perovskite Oxide. Lee et al basically adopts Solid-State Single Crystal Growth (SSCG) as a method for growing single crystals, in which method the single crystal growing process is executed with both a seed single crystal and the polycrystal maintaining their solid state. Furthermore, the object to be solved by Lee et al is controlling the heating process in the SSCG, so that while abnormal grain growths are induced in an interface between the polycrystal and the seed single crystal, abnormal grain growths are repressed inside the polycrystal (See paragraph [0016], on page 2 of Lee et al).

Lee et al discloses that the abnormal grain growth is repressed inside the polycrystal and is induced at the interface between the seed single crystal and polycrystal by the composition changes of the powders, the formation of temperature gradients or the local additions of additives, etc. to grow single crystals having the same structure as the seed single crystal inside the polycrystal (See paragraph [0039], page 3 of Lee et al).

Applicants respectfully contend that the method recited in claim 10 would not be obvious to one having ordinary skill in this field of art in view of the fact that the presently claimed method and Lee et al are each directed to different technical subject matter. Furthermore, the problem they are each designed to solve and, as a result, their respective technical focus are each different from the other.

More particularly, with respect to the aforementioned distinctions in subject matter, the presently claimed method relates to the preparation of a ferroelectric single crystal (Claims 10 to 16) from a ceramic compound, wherein the single crystal is produced by the method referred to as Liquid-State Single Crystal Growth. Lee et al relates, in contrast, to growing single crystals by the method known as Solid-State Single Crystal Growth. As applicants' representative noted to the Examiner during the interview(s), in the technical field of single crystal growth, it is well known that the growth mechanism (i.e., melting and recrystallization) of the Liquid-phase Single-crystal growing process (i.e., according to applicants' invention) is quite different from the mechanism (grain growth in the solid state) relied upon in Solid-state Single-crystal growth technique taught for use by the cited prior art. That is, while the growing process is driven by the abnormal grain growth between the single seed crystal and the poly-crystal in the Solid-state Single-crystal technique, the growth progresses by solidifying a molten ceramic compound in the Liquid-phase Single-Crystal Growth method.

Further, with respect to the differences in the objects focused on, the object of the presently claimed method is to improve the properties of a ferroelectric material and to expand the range of its usage by reducing the limitation on size of single crystal and uniformity of ingredient in growing single crystal. In contrast, however the object to be solved by Lee et al is controlling the heating process in the SSCG, so that while abnormal grain growths are induced in an interface between the polycrystal and the seed single crystal, abnormal grain growths are repressed inside the polycrystal.

In summary, therefore, the presently claimed method is clearly distinguishable from that disclosed in Lee et al. It is directed to a different technical subject than that disclosed by the reference. In addition, it also solves a different problem than that solved by the reference in a different manner, which clearly demonstrates the non-obviousness of applicants' claimed method over the disclosure contained in Lee et al.

Still further, because Lee et al does not disclose any clue, embodiment or experimental results demonstrating or suggesting that the change in composition of the ceramic compound would affect the properties of a ferroelectric material, the composition difference between the present invention and Lee et al should not be treated as being readily conceivable by one of ordinary skill in the art, particularly when it is considered that the

composition of ceramic compound in the present invention is precisely and carefully determined with a view to improving ferroelectric material properties.

For all of the reasons presented above, therefore, the Examiner is respectfully requested to reconsider and withdraw the rejection of independent claim 10 as well as dependent claims 11-16 under 35 USC 103 based on Lee et al. and to issue a Notice of Allowance with regard to all of the claims remaining in the present application. If the Examiner does not agree, however, that all of the claims are in allowable condition, and believes that a further interview concerning this application would advance its progress, he is respectfully invited to telephone applicants' representative at the number below so that such an interview may be scheduled.

THIS CORRESPONDENCE IS BEING SUBMITTED ELECTRONICALLY THROUGH THE PATENT AND TRADEMARK OFFICE EFS FILING SYSTEM ON DECEMBER 2, 2008.

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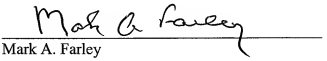
Respectfully submitted,



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